Notes on the status and nesting ecology of Fernandina's Flicker *Colaptes fernandinae*

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Cuba has 23 endemic birds, of which 11 are considered threatened (Collar *et al.* 1992). This situation prompted the authors to study the threatened species over a four-month period in 1995, in order to define the problems faced by the birds and to develop workable conservation plans. The threatened endemic woodpecker Fernandina's Flicker *Colaptes fernandinae* was one of the most closely-studied species. This paper sets out our findings and proposes some conservation measures.

Historical status

Fernandina's Flicker seems never to have been abundant. It does, however, appear to have formerly been more widespread (Figs.1 &2). D'Orbigny (1839) and Malherbe (1862) wrote that it was quite rare while Gundlach (1871–1875) stated that it was locally common. Barbour (1923) judged it 'very rare' but later (1943) said that it 'is locally abundant only . . . in southern Santa Clara and Camagüey'. Gundlach asserted that the species did not occur in Oriente province but there are 48 specimens in museums, all collected between 1884 and 1910, from the area around Guantánamo. Ridgway (1914) recorded examples from Havana (probably erroneously) and from San Diego de los Baños in Pinar del Rio province, which is close to currently occupied locations. Barbour collected over 20 specimens between Rodas and Aguada de Pasajeros in Cienfuegos province, where the species is still to be found today. He also saw 'quite a number' near Trinidad and along the south coast of Camagüey. Rutten (1934) considered it locally common in central Cuba.

Later, Bond (1956) agreed that it was locally common and even numerous in suitable habitat in Las Villas and Camagüey provinces. In 1971 he stated that it was not an endangered species, contrary to Vincent (1966–1971). By 1977 Garrido and Garcia Montaña judged it 'fairly rare' and in 1991 M. Lammertink reported (*in litt.*) that O. H. Garrido and A. Kirkconnell estimated a total population of 300 pairs in three separate areas. They also felt that it was in sharp decline. Any contact with the species demonstrates that it is large, noisy (in the breeding season) and not particularly shy of man, and therefore not difficult to find in suitable habitat. However, the suitable habitat for the bird appears to have declined alarmingly. The species is now only found with certainty in a limited number of areas and was treated as endangered by Collar *et al.* (1992), The up-to-date distribution of the species, following the Catalogue of Cuban Birds (Garrido & Kirkconnell in press) is as follows:

Figure 1. Current range of Locations where *C. fernandinae* recorded:
1. Mil Cumbres. 2. Nortey. 3. Soroa. 4. Loma del Taburete. 5. Cayajabos. 6. Nueva Paz. 7. Ciénaga de Zapata. 8. Bermejas. 9. Corallilo. 10. Aguada de Pasajeros. 11. Rodas. 12. Isabela de Sagua. 13. Sierra de Najasa. 14. La Belén. 15. El Chorrillo. 16. El Recreo. 17. Campos de Veloso. ------ Province border. ⬚ Ciénaga de Zapata.

Figure 2. Historical range of (1878– 1948). Location, year and approximate number of *C. fernandinae* recorded/ collected:
1. San Diego de los Baños (1900). 2. Taco Taco (1916). 3. San Cristobal (1878 & 1933). 4. More than 20 specimens (1915 & 1943). 5. 'Common' (1934). 6. 'Common' (1934). 7. 2 specimens (1928). 8. Trinidad (1923 & 1943). 9. 'Common' (1934). 10. 'Common' (1934). 11. 1923 & 1943. 12. 1913, 1925, 1933 & 1948. 13. 48 specimens (1884– 1919). ------- Province border. ☐Ciénaga de Zapata.

Figure 3. Study site in the Zapata Swamp. The area enclosed by a dashed line is the area in which Fernandina's Flickers were counted. ☐Wet swamp.

Pinar del Rio province:	Sierra del Rosario; in particular Soroa, Mil Cumbres, Nortey, Loma del Taburete, Cayajabos.
Havana province:	Nueva Paz.
Matanzas province:	Zapata Swamp; in particular Los Lechuzos, Mera, Santo Tomaás, Bermejas, Los Cristales, Helechal.
Villa Clara province:	Near Corallilo, El Dorado, Isabela de Sagua.
Cienfuegos province:	Aguada de Pasajeros, Rodas.
Camagüey province:	La Belén (Sierra de Najasa), El Chorrillo.
Holguin province:	Campos de Veloso near Gibara, El Recreo near Velazco.

A particular congregation of nesting birds occurs in the Zapata swamp just north of Bermejas at Laguna de la Majagua (see Fig. 3) and was the focus of this study.

Methods

Observations and measurements of each nest site were made during 84 man-days over a five-week period from 8 April to 12 May 1995 at Laguna de la Majagua and the surrounding area. La Majagua has been a breeding site for several pairs since at

TABLE 1

Nest site measurements (linear values are in metres)—see Fig. 4

Measurement	*n*	Range	Mean
Tree diameter at chest height	7	0·95–1.43	1.24
Nest entrance height	7	3.08–6.13	4.37
Horizontal entrance diameter	7	0.08–0.11	0.091
Vertical entrance diameter	7	0.07–0.1	0.084
Cavity depth	7	0.3–0.98	0.59
Diameter inside entrance	7	0.27–0.32	0.294
Number of trees	7	9–22	14.14
No. of tree and shrub species	7	6–13	9.71

least 1986 (Jackson 1991). Behavioural observations are the subject of a separate paper. The following details were noted in the 0.05 ha area surrounding the nest; diameter of nest tree at chest height; number of trees >30 cm at chest height; number of different species of tree and shrub. This gave a measure of the habitat in the vicinity of the nest site and can be easily compared with other nests in the future.

The following measurements were also taken for each nest: height of nest entrance above the ground; horizontal diameter of nest entrance; vertical diameter of nest entrance; depth of nest cavity; internal diameter of nest at entrance.

The aggregation of nesting birds, as found at Laguna de la Majagua, is not known to occur anywhere else although similar sites appear to occur in the area surrounding Bermejas. However, Fernandina's Flickers nest elsewhere within the dry woodlands along the coast and a count was made within the area outlined in Fig. 3 to give an estimate of the number of pairs in the area. This was done by noting nests found during studies of other threatened species in the area and by a series of walks along the many pathways through the woods. These walks were standardised to 1 h out and 1 h back by the same route to ensure that the observer did not get lost.

Discussions were held with Orlando Ramirez, the forest guard for the area between Playa Larga and Bermejas, to obtain local knowledge of, and threats to, the species as well as learning how local use of the area might affect Fernandina's Flicker's survival.

Results

Nest site measurements

Seven nests were measured and the surrounding habitat surveyed as described in Methods. The results are summarized in Table 1.

Each nest was in a dead palma cana *Saval parviflora* (Fig. 4) and most of the trees in the sample plots were also of this species as a result of the area having been cut over (see Discussion for more detail). A complete botanical list in the vicinity of

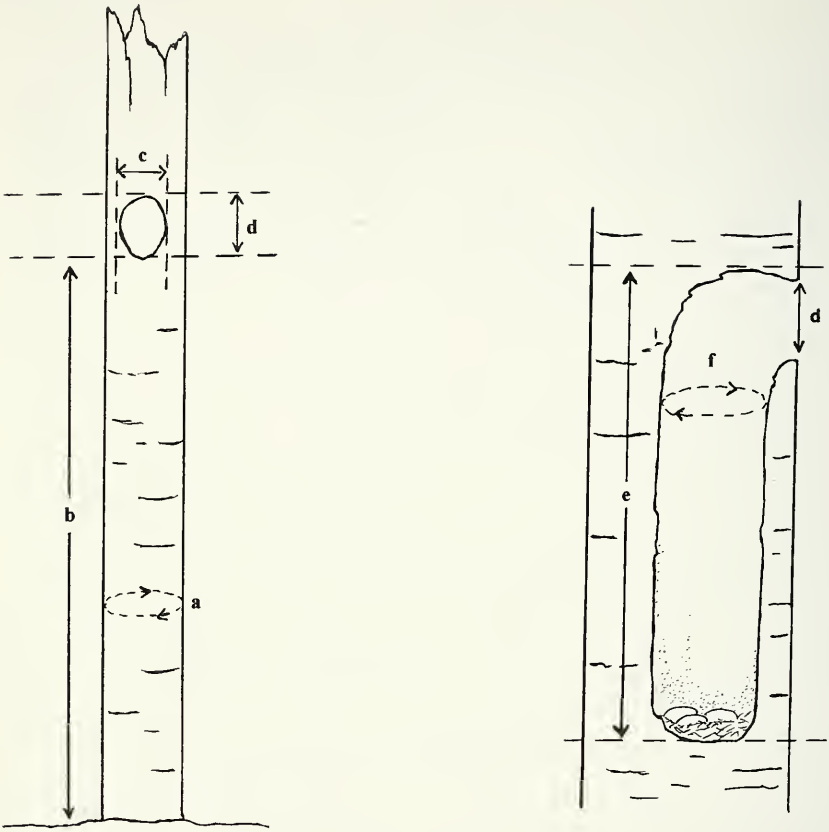

Figure 4. Typical nest of *Colaptes fernandinae* in dead palm tree.
Left—position in tree. Right—cross section of nest. Average measurements of nest: a. Diameter of nest tree at chest height. 1.24 m. b. Height of nest entrance above ground. 4.37 m. c. Horizontal diameter of nest entrance. 9.1 cm. d. Vertical diameter of nest entrance. 8.4 cm. e. Depth of nest cavity. 0.59 m. f. Internal diameter of nest at entrance. 29.4 cm.

each next was not possible, but other species of tree recorded were royal palm *Roystonea regia*, jucaro *Bucida palustris* and soplillo *Lysiloma latisiliquum*.

Census walks

Nineteen census walks were conducted as described in Methods during the study period and Fernandina's Flicker was recorded on 12 of these, either as single birds or pairs, with or without a nest. Twenty four birds were noted, of which 20 were observed as pairs. For the purposes of this census, the four sightings of individuals is assumed to represent a pair of birds based on the fact that the records were made during the

breeding season. Each registration of a bird or pair was remote enough from any other to assume that no bird was counted twice. Together with the birds at Laguna de la Majagua and other casual records, a total of 30 pairs is assumed, made up from 10 pairs recorded on the census walks, four individuals assumed to be halves of pairs, seven pairs at Laguna de la Majagua and nine pairs noted away from these areas whilst doing other work.

Local knowledge

According to Orlando Ramirez, the habitat comprises three zones. The first is a coastal zone varying in width between one and three kilometres characterized by low plant species diversity and a height of around 5–7 m. This zone also has almost no palm trees. The next zone is known as *costanera* and is approximately the same width but has a greater species diversity and height up to 10 m or more. Importantly, it holds a great number of palm trees, mainly of palma cana. The difference between the coastal zone and costanera appears to be simply due to soil depth on top of the limestone bedrock. The innermost zone is the swamp proper, dry grassland from November to May, inundated in the wet season and punctuated here and there with islands of trees and shrubs. Fernandina's Flickers were observed only in the costanera, in which La Majagua is located.

Threats

The entire Zapata Peninsula is a protected area (Scott & Carbonell 1986) and an area of some 10–12 km^2 around La Majagua has been designated a 'special protection area'. However, the protection is only effective when there is a forest guard in the area and Ramirez commented that his workload had been greatly increased since 1994, and there was no fuel for his motorcycle so that he was unable to patrol the area effectively.

There are several other species which nest in holes in palm trees and could therefore be in direct competition with Fernandina's Flicker; West Indian Woodpecker *Melanerpes superciliaris*, Cuban Green Woodpecker *Xiphidiopicus percussus*, Northern Flicker *Colaptes auratus*, Cuban Trogon *Priotelus temnurus*, Cuban Parrot *Amazona leucocephala*, Cuban Parakeet *Aratinga euops*, American Kestrel *Falco sparverius* and Cuban Blackbird *Dives atroviolacea*. Of these, the other three woodpeckers might be expected to compete directly, and in particular the con-generic Northern Flicker (Short 1982).

There were 1–3 pairs of Northern Flickers in the study area throughout the period but only the West Indian Woodpecker was seen to interact with Fernandina's Flicker, entering a nest on several occasions, once seen to leave with an egg and once with a chick. Three pairs of West Indian Woodpeckers were recorded nesting in the study area including one pair in the same tree as a Fernandina's Flicker nest but some 2 m lower down, the entrance being on the other side of the tree.

The human threats to the species and its habitat come from two main sources: clear felling of areas for food production and pushing over of nest trees (dead palms)

by people looking for Cuban Parrot chicks to sell. Woodcutting is managed by the Empresa Forestal within the park and has a strict strategy—all the species of tree within the swamp are cut for various uses except for palm trees. Only the leaves of these may be cut. Felling is done in small areas to minimise the effect on wildlife. How often an area is cut depends on the usage; wood for charcoal can be re-cut after 11–12 years but it may be 20–30 years for other uses. Uncontrolled fires only occur in the swamp proper, not in the costanera.

Wholesale clearance of an area is illegal but, according to Ramirez, the authorities often take no action because they know that people need more food. There are very real shortages in the villages of the swamp. The problem of the destruction of dead palm trees means that not only are broods or clutches lost (any palm tree with a nest hole in it is pushed over) but that tree is lost forever as a nest site. During the period of our fieldwork, three trees were destroyed in this way at La Majagua, two of which held Flicker nests and one, an American Kestrel nest. As mentioned above, there are not the resources for policing the area effectively which means that the birds are coming under increasing pressure.

Discussion

Our study sheds some light on the reasons for the species' decline and provides some ideas both for conservation measures and for further studies.

The survey of the nesting habitat provides baseline data for comparison with nests other than those in the 'group'. The presence of dead palm trees, especially palma cana, appears to be a necessity; nests have not been reliably recorded in any other situation.

The other features of La Majagua that we consider are important for a species that is primarily a terrestrial feeder, i.e. proximity to water in the dry season, soft ground and low secondary growth, are not present together where pairs nest singly. It is therefore possible that it is these features which have encouraged the birds to nest so close together. It is equally possible, however, that this is a traditional nesting site where the cutting-over (approximately five years before these observations) did not completely destroy its appeal for the birds. Perhaps they nested at this density in former times. Another possibility is that the dead palms were sufficiently old and weakened by insects and fungi to make them significantly easier to excavate for nest holes.

It is difficult to estimate the number of pairs of Fernandina's Flickers because they are sparsely and apparently randomly distributed throughout the dry woodlands. It is not possible, for instance, to say that the concentration of pairs at La Majagua is repeated anywhere within the swamp. However, this study located 30 pairs of birds and a crude estimate for the area between Los Sabalos and Bermejas (see Fig. 3) would be 60 pairs. Fernandina's Flicker is found in other parts of Zapata and the authors' experience suggests that there are probably only 100–120 pairs left overall, compared with the 1991 estimate of 300 pairs. If these estimates really indicate that

a decline of this magnitude has occurred in four years, in the area that is considered the stronghold for the species, then conservation action is urgently required.

Our suggested solution comes in two parts: the first is education. A poster campaign through the villages in the area would bring home to the local people the importance and vulnerability of some of the species (not only Fernandina's Flicker) that live around them. Because they see these birds, in some cases, every day, the local people are not necessarily aware of their status. A noisy flock of up to 40 Cuban Parrots can be seen daily in Bermejas and it is difficult to convince people that this is an endangered bird. Secondly, we consider that a nest box scheme should be tried. We have a range of measurements for nest holes so that a suitable box could be constructed. The boxes should be fitted securely to live palm trees, both within and close to the existing nesting area. If the birds use them, there will be two benefits; the nesting area could gradually be enlarged (and during this we may learn something of what constitutes unsuitable nesting habitat) and it is not possible to push over live palms. The authors are currently seeking funding for the nest box scheme.

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New information on the Snow Partridge *Lerwa lerwa* (Hodgson 1833) and its systematic position

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The Snow Partridge *Lerwa lerwa* is one of the most poorly known species of the subfamily Perdicinae, if not the whole family Phasianidae. Since its description for science in 1833 there have been only three publications on the species, two of which were short taxonomic notes proposing new subspecies. The only publication on its ecology appeared as recently as 1992 (Li & Lu 1992). The only other information is limited to notes on distribution and habitat collected during general avifaunal surveys. There are a few references contained in regional bird faunas (Ali 1962, Ali & Ripley 1969, Vaurie 1972, Roberts 1991) and the most comprehensive information on the distribution and the natural history of the Snow Partridge to date is Baker (1935). The information and even complete sentences from this publication have been repeated in all subsequent accounts of the species.

Whilst its remote distribution may account for the scarcity of information on ecology and complete lack of behavioural data, it is rather surprising that there has been no museum study to investigate its systematic relationships more clearly. This monotypic genus has always been listed with three or four genera of Palearctic mountain partridges (*Ammoperdix, Alectoris, Tetraogallus* and *Tetraophasis*) at the start of all taxonomic lists of the subfamily Perdicinae, despite the absence of any